



An Energy Efficiency Workshop & Exposition

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Palm Springs, California

## *Distributed Energy: Contemplating CHP?*

# **The Federal Market and FEMP CHP Services**

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**June 4, 2002**



# *Presentation Outline*

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- **Federal Market Assessment for CHP**
- **Hurdles to CHP deployment**
- **FEMP Services– ADD CHP**
- **CHP Screening Results at federal sites**
- **Conclusions**

# ***Why Distributed Energy?***

- **Support Multiple Goals:**
  - **Increase Efficiency and Reliability**
  - **Reduce Costs & Emissions**
  - **Physical Infrastructure for Clean Technologies of Tomorrow (Hydrogen, Fuel Cells)**
  - **Knowledge and institutional capability to manage on-site power systems**

# Advantages of CHP

- **More efficient form of DER**
- **Commercially available today--**
- **Proven but underutilized technology**
- **Increased energy security**
- **Agencies interested— but process is not easy**

# *What is Federal CHP Potential?*

**Base Case: Sites with simple payback in less than 10 years = 1500-1600 MW (gas recip-ICE or gas combustion turbine)**

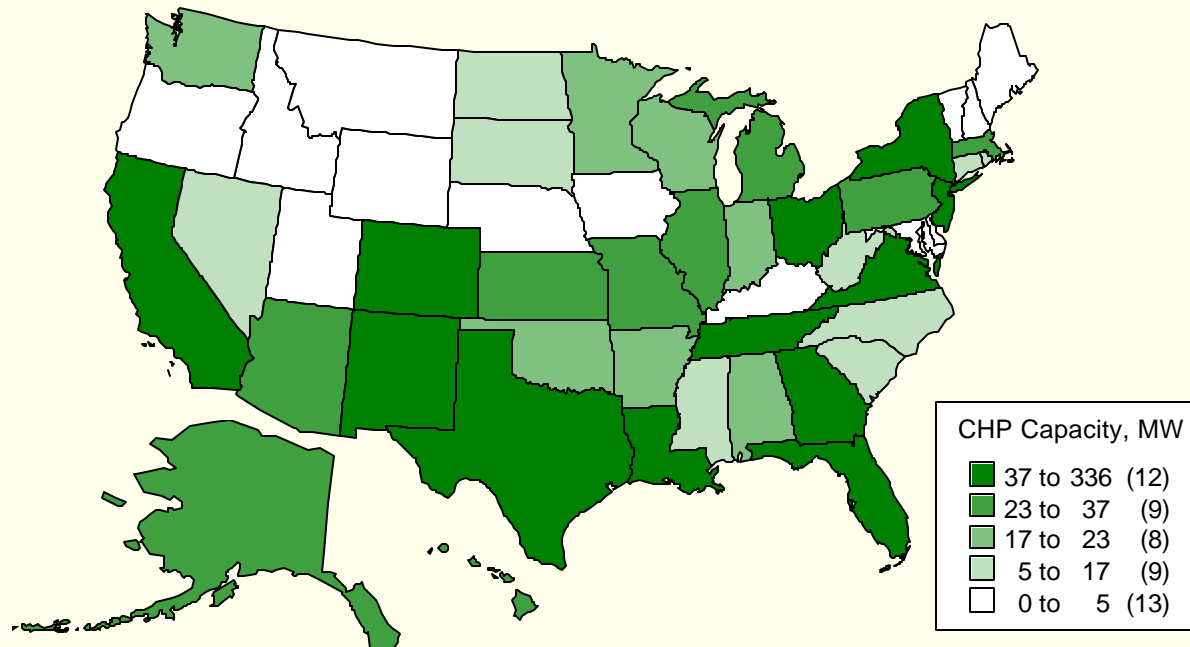
- **Market Assessment of CHP at Federal sites (Feb. 2002)**

- **Reports available from FEMP booth.**
- **Full report online at**  
[www.ornl.gov/femp/pdfs/chp\\_market\\_assess.pdf](http://www.ornl.gov/femp/pdfs/chp_market_assess.pdf)

## ***Federal CHP Market Assessment Parameters:***

- ✓ **GSA federal building database**
- ✓ **EIA-CBECS energy intensities**
- ✓ **EIA Year 2000 industrial energy rates**
- ✓ **CHP system prices/performance**
- ✓ **Tech-specific performance assumptions**
- ✓ **Operating parameters based on building type**

# *Distribution of CHP Potential at Federal Sites--over 1500 MW*



# *Assessment: 1500 MW of Federal CHP Potential Offers:*

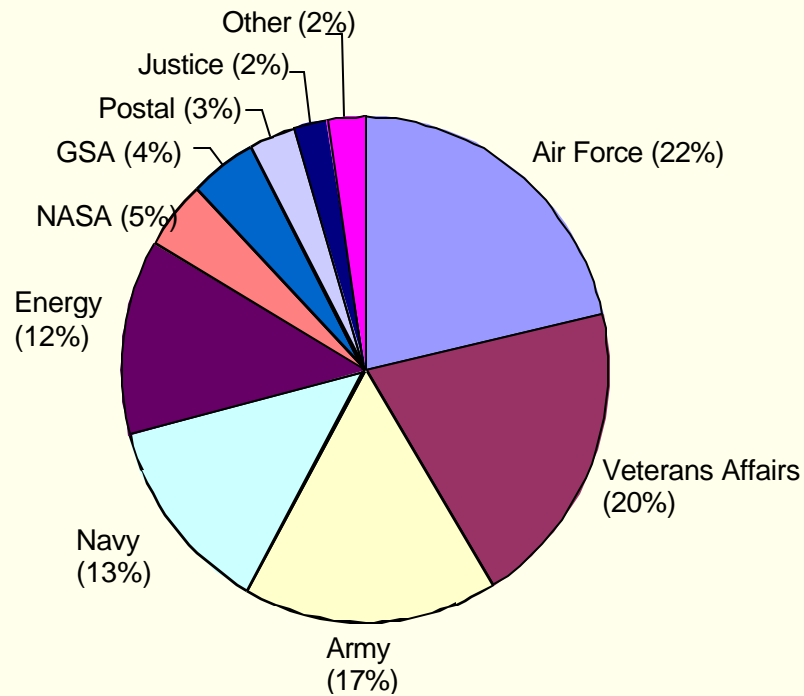
- ✓ \$170 million/year in energy cost savings
- ✓ Avg. return on investment <8 years
- ✓ 50 trillion Btu/yr of source energy savings
- ✓ 4 million metric tons/yr of avoided CO<sub>2</sub>
- ✓ Increase reliability/security representing 13% of total federal electricity purchased (2000)

**- e.g. this is significant!**

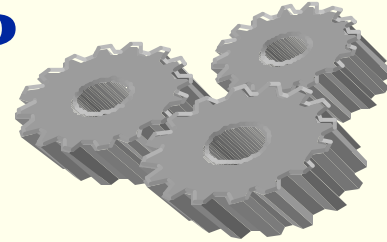




## *Federal CHP Potential: large, energy intensive facilities dominate*



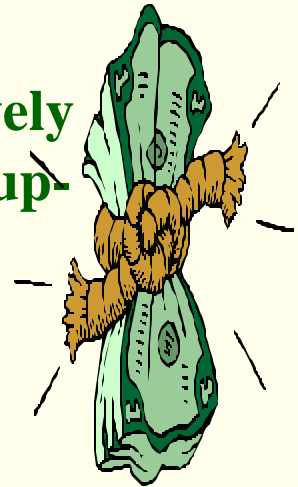
## ***Factors Favoring CHP***



- **High electric rates**
- **Energy security upgrades planned**
- **Gas/alternate fuel available**
- **Thermal demand on site, follows electric load**
- **Compatible infrastructure (central heat and cooling systems)**
- **Large, steady thermal and electric loads**

# *Rules of thumb and assessments– are nice but how the market really works....*

- ❑ **CHP project potential and development process is very *site-specific***
- ❑ **Sometimes, federal facility is only part of a larger load**
- ❑ **Agencies need financing – CHP is relatively new in the financed project market and up-front design costs may limit support by ESCOs/utilities**

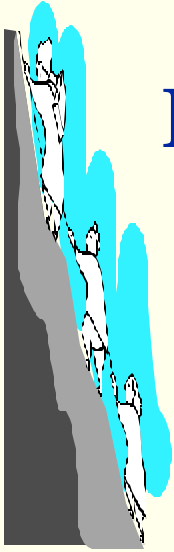




## *Hurdles to DER-CHP:*

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- **Costs and complications = large lead time**
- **Custom, Site-specific designs**
- **Energy (natural gas) price uncertainty**
- **Air quality/emissions issues**
- **Siting, permitting, local regulations**
- **Utility stand-by, exit, and interconnection fees**



## **Federal *Hurdles to DER-CHP***

- **Facility managers lack time to assess potential**
- **Staff turnover and budgets limit large, long-term projects**
- **Lack reliable information on performance and costs**
- **Low utility electric rates**
- **Prefer to avoid responsibilities of power business; concerns about O&M**

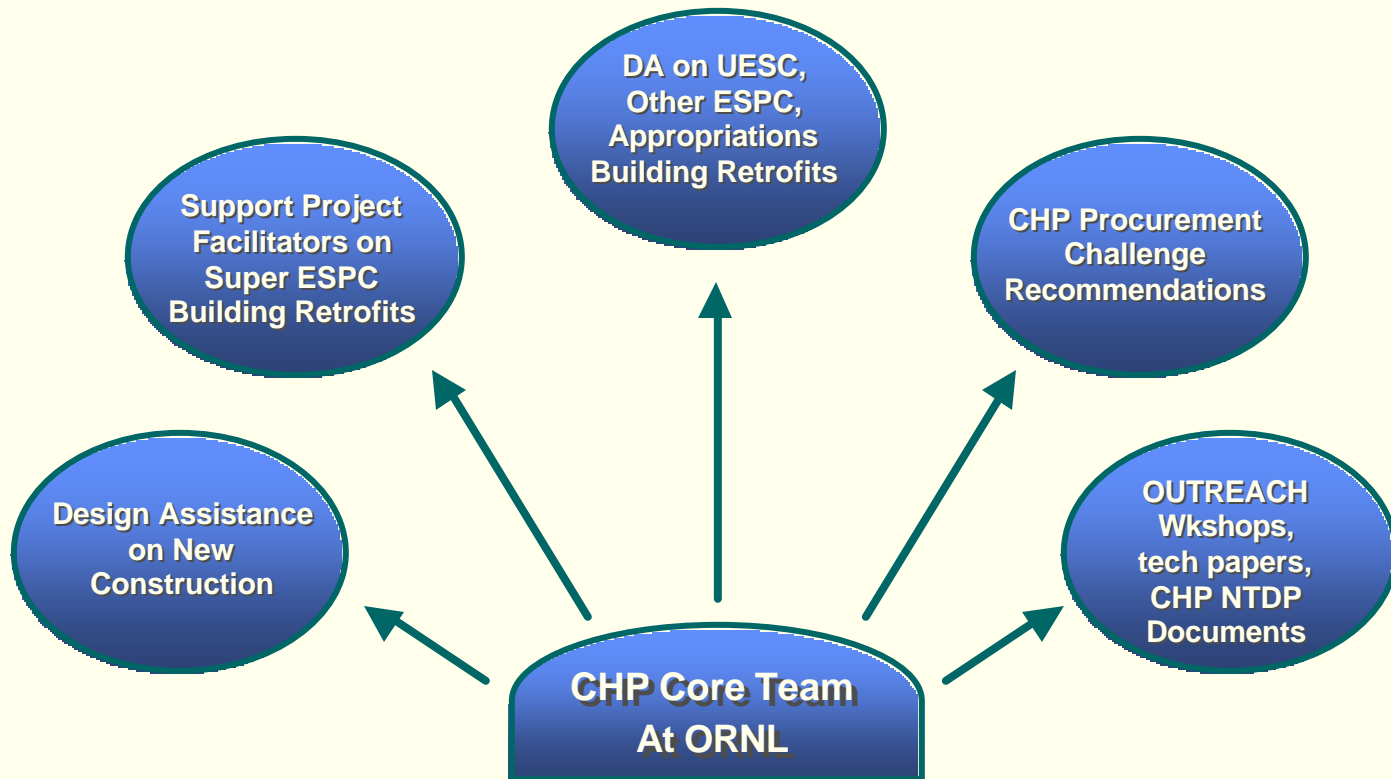


## ***FEMP CHP Strategy***

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- ❑ **Target assistance to address hurdles in federal sector**
- ❑ **Focus on markets with highest potential for success**
- ❑ **Help interested agencies make informed DER-CHP decisions**
- ❑ **Move good projects to deployment**

# *FEMP Services Support CHP*





## *FEMP Call for DER Projects:*

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- Funds to support showcase projects
- Application form on FEMP website

***DEADLINE Is  
June 14!***

OAK RIDGE NATIONAL LABORATORY  
U. S. DEPARTMENT OF ENERGY

**FEMP**  
FEDERAL ENERGY MANAGEMENT PROGRAM





## ***FEMP DER Workshops***

- **Distributed Energy Workshops**
  - Detailed technical information
  - Case studies from federal sites
  - Link federal energy managers with resources
- **Upcoming DER-CHP Workshops:**
  - -Chicago, June 25-26
  - -Boston, October 23-25





## ***FEMP – “ADD CHP”***

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- **Accelerated Development and Deployment of Combined Heat and Power (CHP)**
- **Make proven CHP technology more accessible to the federal sector**

## *FEMP ADD CHP Offers Support to Federal Sites*

- **Need estimate of CHP potential?**
  - **Quick Screening Service**
- **Need information on options and performance?**
  - **TA to agencies and project facilitator**
- **Need financing?**
  - **Assistance to identify potential partners**



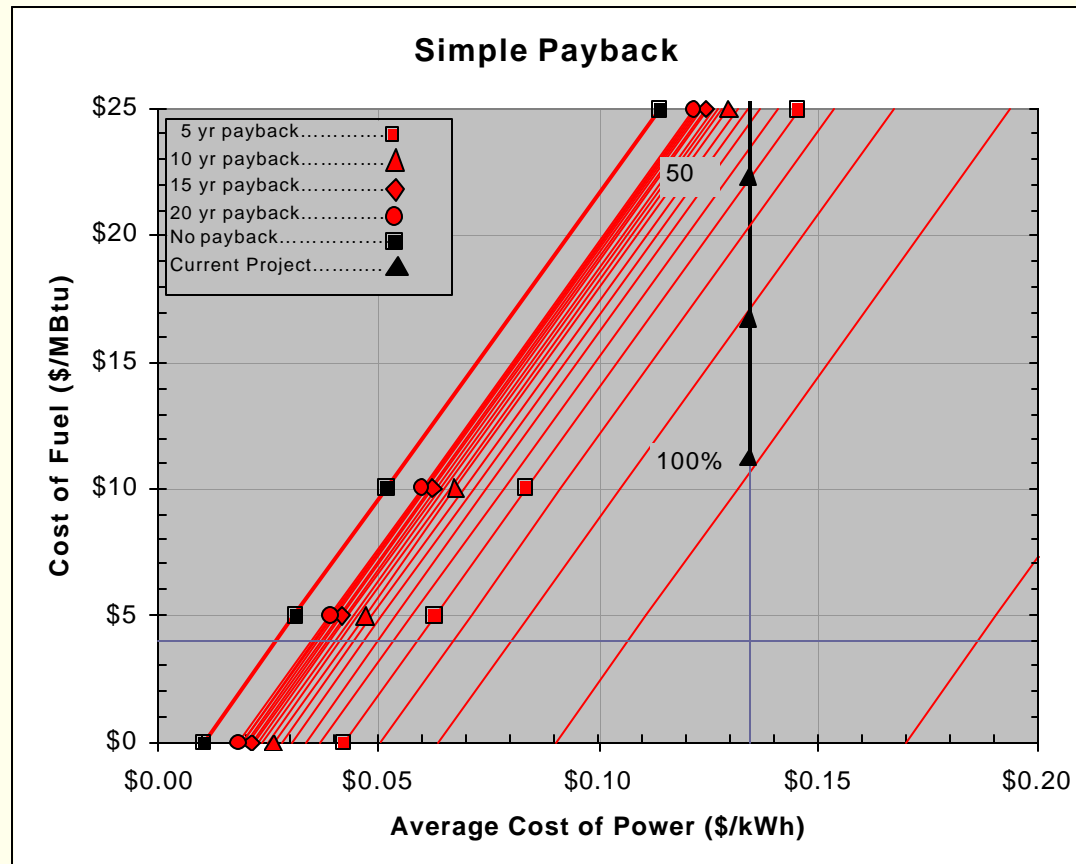


## *Free CHP Screening for Federal Sites*

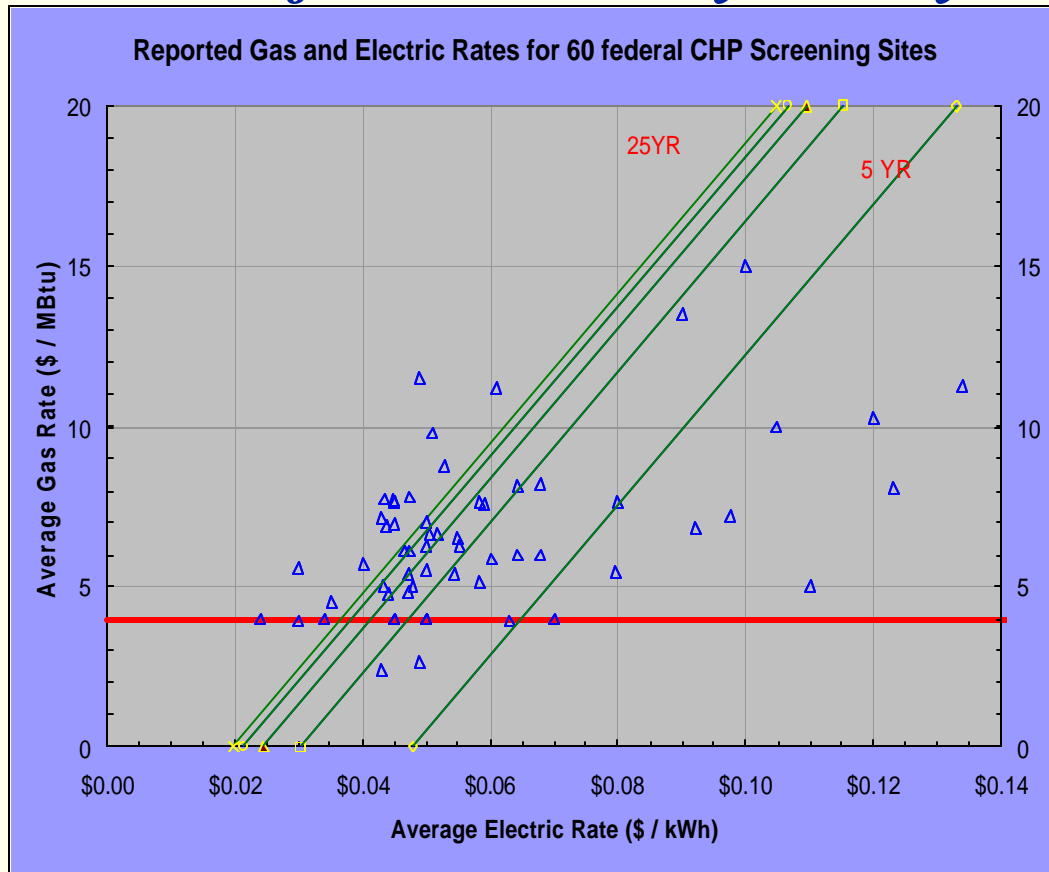
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- **Site completes short excel data form**
  - Easy to access information on energy costs, use and existing equipment
- **FEMP sends report to site summarizing results of screening analysis**
  - CHP metrics, favorable and unfavorable
  - If/when is further study merited?

## *Reports to agencies include graphic feedback*

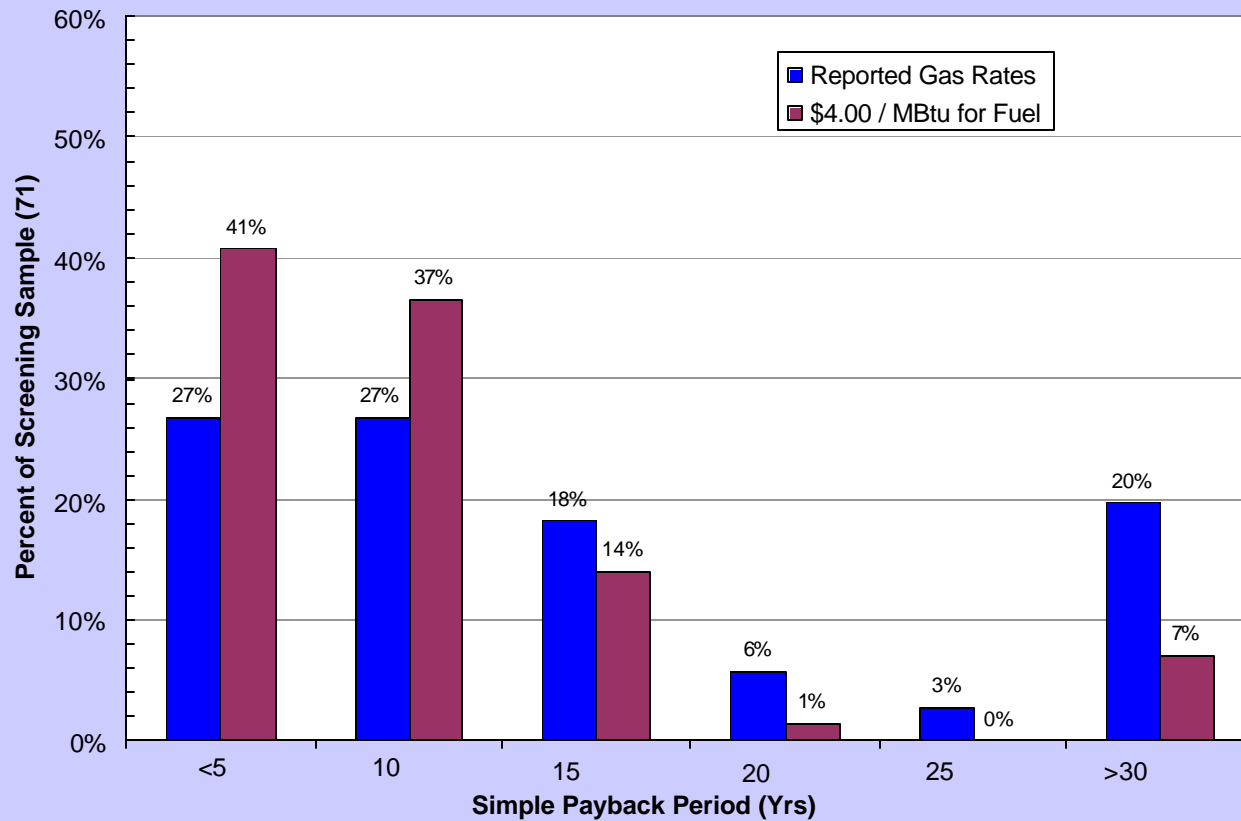


# *CHP Screenings– Federal fuel costs vary widely*



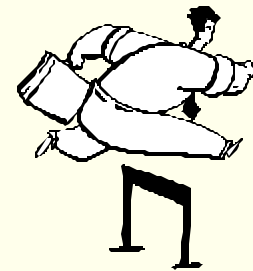
# Screening Results

Simple Payback Periods  
100% Waste Heat Utilization



## *Screening Results:*

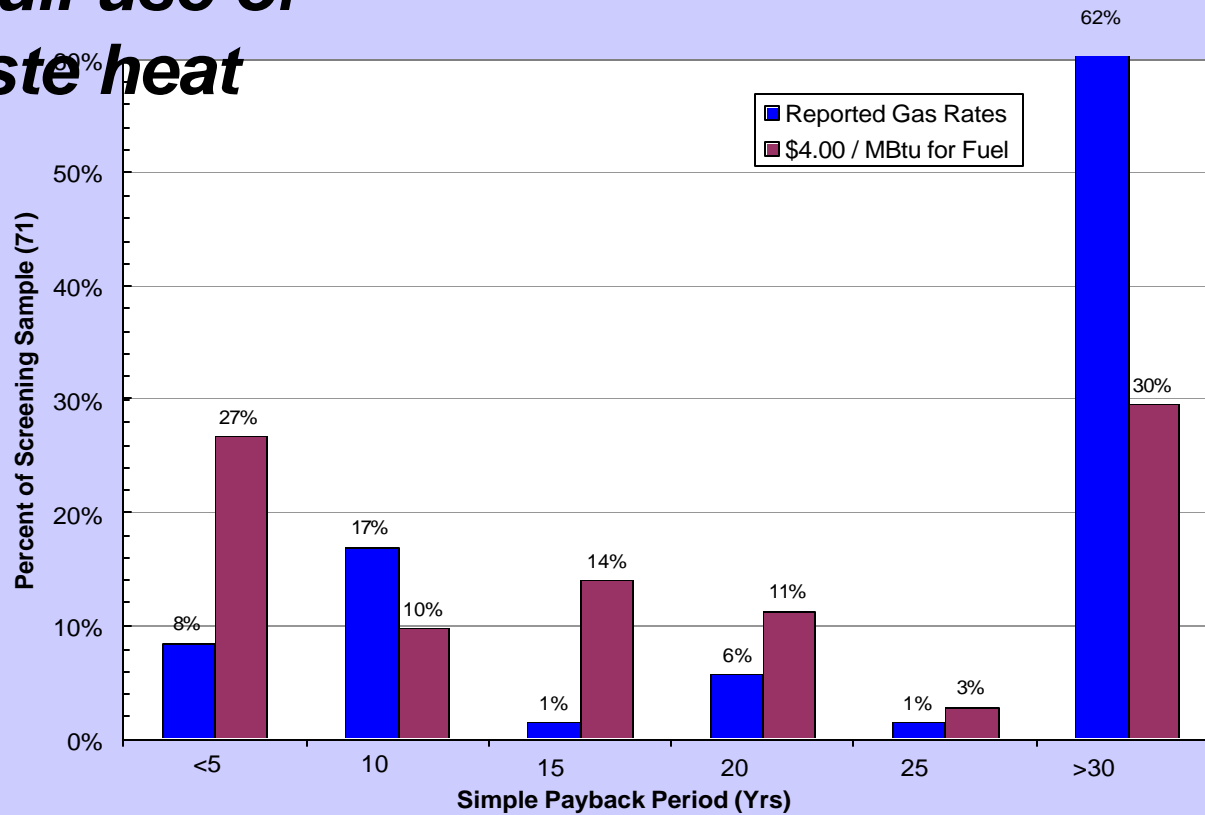
- **Need to maximize use of waste heat with CHP**
- **Best opportunities are in large, energy intensive sites, hospitals, military bases**
- **Energy security/other upgrades improve economics**
- **Low electric rates and uncertainty over future gas/fuel prices present obstacles**





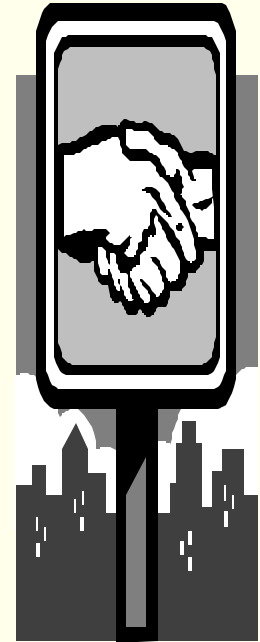
# ***Economics are Sensitive to full use of waste heat***

**Simple Payback Periods  
50% Waste Heat Utilization**



## *Who Does What?*

- **Private partners are essential--**  
**promote, market, sell, finance,**  
**implement**
  - the CHP industry & associations  
(USCHPA, AGCC, IDEA, etc.)
  - ESCOs and utilities
- **FEMP** provides access to unbiased  
assistance on equipment, design and  
financing to help agencies make  
informed decisions and secure best-  
value projects

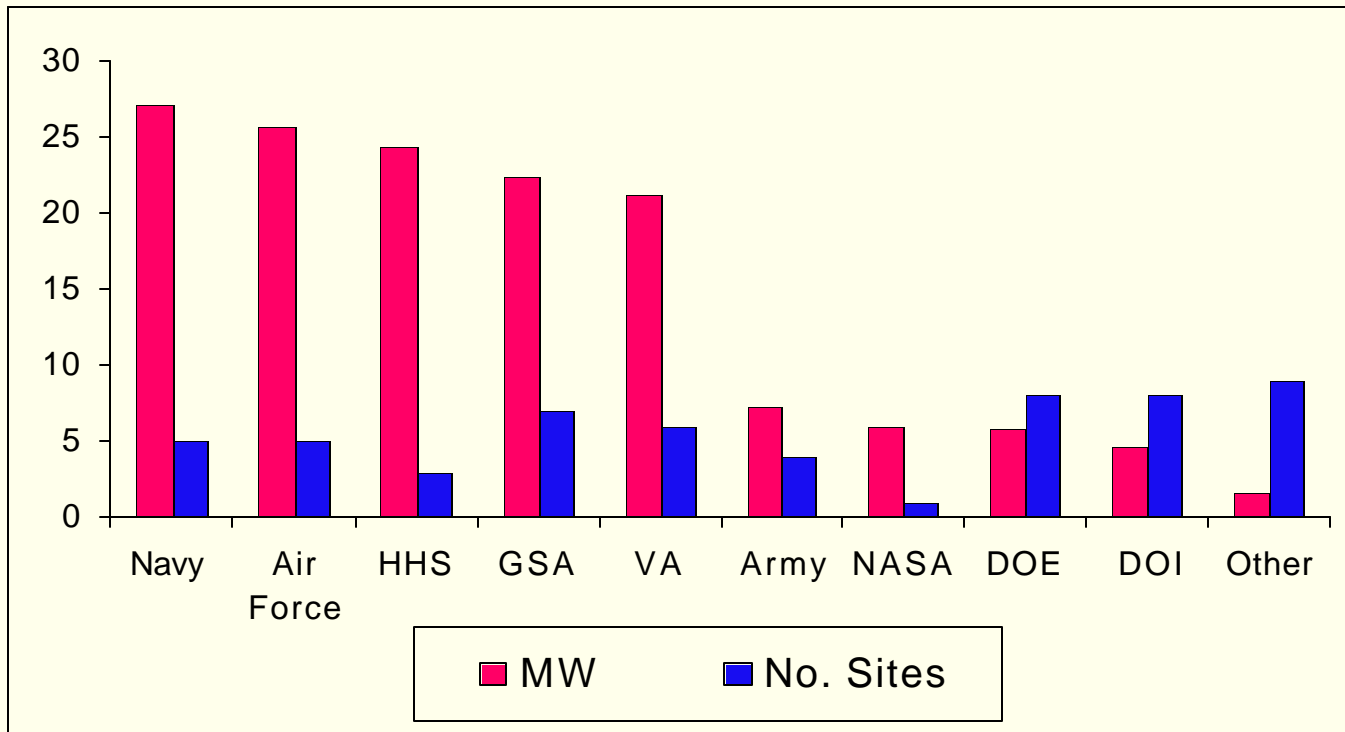


# *Federal Agencies Are Embracing CHP As Never Before*

- **Secure, reliable power for mission support**
  - **Mitigate electric rate increases**
  - **Achieve energy/emission reduction mandates**
- *90 federal sites are studying, requesting assistance for, or actively developing CHP projects...*



## *Federal Agencies Where The CHP Action Is*





## *Summary: call FEMP for assistance with CHP projects*

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### **FEMP's Team can help agency sites**

- **Determine if they have CHP potential**
- **Understand options with commercial technology**
- **Ensure best-value configurations go into their projects**
- **Help avoid surprises**



## *CHP on the Web:*

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- **Funding opportunities, Workshops, Case studies:**  
[http://www.eren.doe.gov/femp/techassist/der\\_resources.htm](http://www.eren.doe.gov/femp/techassist/der_resources.htm)  
[!](#)
- **CHP Screening form, “Analysis of CHP Potential at Federal Sites” (Market Assessment), etc:**  
[www.ornl.gov/femp/pdfs/chp\\_market\\_assess.pdf](http://www.ornl.gov/femp/pdfs/chp_market_assess.pdf)
- **DOE Websites-FEMP** <http://www.eren.doe.gov/femp/>  
**Integrated Power Technologies and links:**  
<http://www.eren.doe.gov/power/>

## ***FEMP CHP Contacts***

- **Contact your Regional DOE Office:**  
[http://www.eren.doe.gov/femp/financing/femp\\_services\\_who.html](http://www.eren.doe.gov/femp/financing/femp_services_who.html)
- **DER/CHP Programs at FEMP HQ:**  
[Shawn.Herrera@ee.doe.gov](mailto:Shawn.Herrera@ee.doe.gov) (202) 586-1511
- **Keith Kline, ORNL FEMP CHP**  
**coordinator (865) 574-4230**  
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